Tribhuvan University
Institute of Science and Technology
BSc. CSIT – Third Semester
Model Question Paper

Course Title: Computer Architecture
Course No.: CSC 201
Full Marks: 80 Pass Marks: 32

Long Answer Questions
Attempt any two questions. (2x10=20)

1. What do you understand by interrupt? Draw and explain the flow chart for interrupt cycle. (2+8)
2. State and explain the different types of data manipulation instructions used in a typical computer. (10)
3. Why do computers need input-output interface? Explain the sequence of operations carried out during CPU-IOP Communication with the help of suitable flowchart. (3+7)

Short Answer Questions
Attempt any ten questions: (10x6=60)

4. Derive the circuit for 3-bit parity generator and a 4-bit parity checker using parity bit. (6)
5. Explain the shift micro-operation in brief.
6. Explain the difference between hardwired and micro-programmed control units. Is it possible to have a hardwired control with a hardwired control associated with a control memory? (4+2)
7. Show using the concept of addition/subtraction algorithm that adding B after the operation A+B'+1 restores the original value of A. what should be done with the end carry? (5+1)
8. Describe the memory mapping table in a paged system. (6)
9. Starting from an initial value of R=11011101, determine the sequence of binary values in R after a logical shift left followed by a circular shift followed by a logical shift right and a circular shift left. (1.5+1.5+1.5+1.5)
10. In your opinion, what different hardware components are required to design a basic computer? (6)
11. What are the micro-instructions needed for fetch routine? Write a symbolic micro-operation for the fetch routine. (3+3)
12. Differentiate between RISC and CISC computers. (6)
13. What do you understand by the memory hierarchy in a computer system? (6)
14. Why does DMA have priority over CPU when both request a memory transfer? (6)
15. Write short notes on the following:
    a. Alphanumeric representation
    b. Divide overflow.

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(Computer Architecture) — Time: 3 hours.

Candidates are required to give their answers in their own words as for as practicable.

The figures in the margin indicate full marks.

Long Questions:

Attempt any two questions: **(2x10=20)**

1. Explain the different types of addressing modes and compare each other.
2. What are the major difference between I/O buses and interface Modules? What are the advantage and disadvantage of each?
3. What are the three possible modes to transfer the data to and from peripherals? Explain.

Short Questions:

Attempt any ten questions: **(10x6=60)**

4. Difference between parity checker and parity generator.
5. What do you mean by shift micro-operations? Explain.
6. Explain the computer instructions with example.
7. Mention the types of interrupt and explain it.
8. What do you mean by field decoding? Explain.
9. Write down the following equation in three address and one address instruction.
   Y=AB+(C x D) +E (F/G).
10. Explain the characteristics of RISC and CISC.
11. Explain the booth algorithm with example.
12. What is the main function of DMA? Mention the three possible DMA configurations.
13. What are the different types of I/O commands? Explain.
14. Differentiate between associative page table and page replacement.
15. Write short notes on the following:
    (a) Memory space (b) Address space.

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Long Questions:

Attempt any two questions: **(2x10=20)**

1. Explain the Micro-program sequencer with example.

2. Explain with example of Data manipulation instruction.

3. Explain the non-restoring Division algorithm, flowchart Hardware Implementation with example.

Short Questions:

Attempt any ten questions: **(10x6=60)**

4. What do you mean by Instruction format? Explain.

5. Differentiate between Hardwired and Micro-program control unit.

6. What do you mean by logic micro-operations?

7. Differentiate between direct and indirect addressing modes.

8. Explain with example of Data transfer instructions.

9. What are the major difference between RISC and CISC architecture?

10. Explain the subtraction algorithm with signed 2's complement.

11. Differentiate between isolated I/O and Memory Mapped I/O.

12. What is DMA transfer? Explain.

13. What is the role of input-output processor (IOP) in computer system? Explain.

14. What is the memory management hardware? Explain.

15. Short notes on the following:
    (a) Sequential memory hierarchy.
    (b) Random memory hierarchy.